The low FODMAP diet for irritable bowel syndrome: from evidence to practice

Get handouts etc. by following the link below:

learn.extension.org/events/3300

militaryfamilies.extension.org

militaryfamilies.extension.org/webinars
Dr. Caroline Tuck

- Australian Accredited Practising Dietitian with experience in clinical practice and research
- Completed her PhD with the research team at Monash University.
- Currently undertaking a post-doctoral research fellowship at Queen’s University in Canada focusing on understanding the physiological affects of diet on the gastrointestinal tract.
- Published a number of scientific journal articles and received many awards including the award of excellence in nutrition and dietary fibre research at the Nutrition Society of Australia conference in 2016.
Learning objectives

At the end of this session, participants will be able to:

– Describe the mechanisms of action and evidence for the use of the low FODMAP diet in patients with irritable bowel syndrome
– Be familiar with the concepts of the 3 phases for implementing the low FODMAP diet
– Discuss ways in which the diet could be modified to suit the needs of the individual

Overview

• Diagnosis of irritable bowel syndrome
• The low FODMAP diet mechanisms of action and scientific evidence
• Application of the low FODMAP diet in practice
• Adjunct therapies to the low FODMAP diet
• Ways to individualize the diet to your patients
Irritable bowel syndrome

- Irritable Bowel Syndrome (IBS) causes symptoms such as abdominal pain, bloating, flatulence, constipation and diarrhea.
- The exact cause of IBS is unknown but may be related to one or more of:
  - changes in GI motility
  - alterations to the microbiota
  - visceral hypersensitivity
  - immune activation…
- Types, severity and combinations of symptoms are different in everyone.
Diagnosis of IBS

• IBS is diagnosed based on symptom criteria after the exclusion of all other gastrointestinal disorders.
• The Rome IV criteria is used to confirm a diagnosis of IBS:
  – Recurrent abdominal pain, on average, at least 1 day per week in the last 3 months, associated with 2 or more of the following criteria:
    1. Related to defecation
    2. Associated with a change in frequency of stool
    3. Associated with a change in form (appearance) of stool
  – Criteria fulfilled for the last 3 months with symptom onset at least 6 months before diagnosis.

Red flags… and when to refer on

Presence of ‘red flags’ indicates that the patients symptoms may not be due to IBS and require further medical review
  – Weight loss
  – Aged > 50 years
  – Nocturnal symptoms
  – Rectal bleeding
  – Iron deficiency
  – Family history of colon cancer
  – Fecal soiling
## Who should use the low FODMAP diet?

<table>
<thead>
<tr>
<th>People who SHOULD use it</th>
<th>People who should NOT use it</th>
</tr>
</thead>
<tbody>
<tr>
<td>Someone who has spoken to their doctor about their GI symptoms</td>
<td>Someone who does not have any IBS symptoms</td>
</tr>
<tr>
<td>Someone who has had the appropriate tests to ensure that they do not have any other problems with their GIT</td>
<td>Someone trying to lose weight</td>
</tr>
<tr>
<td>Someone who has seen a Gastroenterologist about their GI symptoms</td>
<td>Someone who has been experiencing IBS symptoms, but has not spoken to their doctor about it</td>
</tr>
<tr>
<td></td>
<td>Someone who thinks they might be sensitive to foods but has not had any tests done with their doctor</td>
</tr>
</tbody>
</table>
The low FODMAP diet

• Originally developed by the research team at Monash University in Australia
• Studies have now been conducted worldwide showing efficacy for reducing symptoms of irritable bowel syndrome
• Use of the low FODMAP diet supported by meta-analysis
• Should only be used under the guidance of a Dietitian

The low FODMAP diet

• Fermentable
• Oligosaccharides
• Di-saccharides
• Mono-saccharides
• And
• Polyols
Mechanisms of action of FODMAPs

Please take 3 minutes to watch this video: https://www.youtube.com/watch?v=Z_1Hzl9o5ic

When finished, raise hand by clicking 📞

FODMAPs can have an osmotic action, drawing more water into the intestinal lumen.

The FODMAP Grand Tour Down Under: How the Monash University low FODMAP diet helps symptoms of IBS

Murray et al. 2013 AJG
Mechanisms of action of FODMAPs

FODMAPs can increase fermentation in the colon leading to increased gas production.

Other mechanisms of action have been proposed, but require more robust scientific evaluation.

Evidence for the low FODMAP diet

- Symptoms improved in patients with IBS
- No difference for healthy controls
Evidence for the low FODMAP diet

Symptom improvement can be maintained after re-challenge

Harvey et al. 2017 WJG

Harvey et al. 2017 WJG
Potential long-term safety concerns

Dietary modifications have potential to:

- Reduce nutritional adequacy / food variety
  - Data-to-date suggests nutritional adequacy is largely maintained

- Reduce quality-of-life
  - Studies to date have shown improvement in quality-of-life

- Alter the microbiota
  - Studies have shown alterations in the microbiota, with some reductions in fecal *Bifidobacteria* noted, but the implications of this are not fully understood
Implementing the diet in practice

3-step process to be undertaken under guidance of a Dietitian

1. Reduce total FODMAP intake (2-6 weeks)
2. Re-challenge to assess tolerance
3. Long term ‘maintenance phase’
Phase 1: Reduce FODMAP intake

- Phase 1 involves reducing FODMAP intake in the patient’s diet for a period of 2-6 weeks
  - Patients need to understand this is not a long-term diet

- Important to explain the mechanisms of action of FODMAPs to the patient

- The level of restriction can be modified to meet the needs of the individual patient

<table>
<thead>
<tr>
<th>FODMAP subgroup</th>
<th>High FODMAP food examples*</th>
<th>Low FODMAP alternative examples*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excess fructose</td>
<td>Honey, Mango, apple, pear</td>
<td>Maple syrup, Orange, kiwi fruit</td>
</tr>
<tr>
<td>Lactose</td>
<td>Cow’s milk, yoghurt, custard, soft cheese</td>
<td>Lactose free milk, lactose free yoghurt, hard cheese</td>
</tr>
<tr>
<td>Polyols (sorbitol, mannitol)</td>
<td>Avocado, apple, pear, cauliflower, mushrooms</td>
<td>Strawberries, grapes, green beans, peppers</td>
</tr>
<tr>
<td>Fructans</td>
<td>Wheat, onion, garlic, artichokes</td>
<td>Spelt sourdough bread, gluten free breads/pasta, scallions</td>
</tr>
<tr>
<td>Galacto-oligoasaccharides</td>
<td>Pulses, cashews, pistachios, soy</td>
<td>Canned lentils, brazil nuts, macadamias</td>
</tr>
</tbody>
</table>

*Due to ongoing research and food analysis, food lists often become outdated. Resources such as the Monash University Smartphone App are the best way for dietitians and patients to stay up to date

Source: Monash University, Low FODMAP smartphone app
Phase 2: Re-challenge

- Re-challenging is a key part of the use of the low FODMAP diet to treat gastrointestinal symptoms
- Should be undertaken under the guidance of a dietitian
- Not a one-size-fits all approach, approach should be individualized
- The aim of re-challenging is to find a balance between good symptom control and expansion of the diet

<table>
<thead>
<tr>
<th>FODMAP</th>
<th>Suggested food</th>
<th>Quantity</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excess fructose</td>
<td>Honey, Mango</td>
<td>1 tsp, ¼ mango</td>
<td>Daily for 3 days</td>
</tr>
<tr>
<td>Lactose</td>
<td>Milk, Yoghurt</td>
<td>½ cup, 200 g</td>
<td>Daily for 3 days</td>
</tr>
<tr>
<td>Sorbitol</td>
<td>Avocado, Apricot</td>
<td>⅔-⅔ avocado, 1 small</td>
<td>Daily for 3 days</td>
</tr>
<tr>
<td>Mannitol</td>
<td>Mushroom, Cauliflower</td>
<td>½ cup, ½ cup</td>
<td>Daily for 3 days</td>
</tr>
<tr>
<td>Fructose + sorbitol</td>
<td>Apple, Pear</td>
<td>½ apple, ½ pear</td>
<td>Daily for 3 days</td>
</tr>
<tr>
<td>Fructan (wheat)</td>
<td>Wholemeal bread, Pasta</td>
<td>1 slice, 1 cup</td>
<td>Second daily for 3 days</td>
</tr>
<tr>
<td>Fructan (onion/garlic)</td>
<td>Onion, Garlic</td>
<td>1 ring, ¼-½ clove</td>
<td>Second daily for 3 days</td>
</tr>
<tr>
<td>GOS (galacto-oligosaccharides)</td>
<td>Lentils, Chickpeas</td>
<td>½ cup, 2 tbs</td>
<td>Daily or second, daily for 3 days</td>
</tr>
</tbody>
</table>

What food would the patient like to try?
What types of foods would have the biggest impact on nutritional adequacy?
Adjust quantity according to symptom severity, patient preference, usual dietary intake.
Phase 2: Re-challenge

- Tolerance to FODMAP subgroups is variable between individuals
- Dietitians play an important role in guiding the patient through re-challenge process
  - 68% patients displayed ‘GOS-sensitivity’ with high GOS foods (Tuck et al. 2017 AJG)
  - 45% with inulin in solution (Major et al. 2017 Gastroenterology)
  - 38% with fructose in solution (Major et al. 2017 Gastroenterology)

### Phase 2: Interpreting challenges

- **Well tolerated**
  - Re-introduce food back into the diet
  - Trial larger serving sizes
- **Manageable symptoms**
  - Re-introduce when able
  - Include small amounts on less frequent occasions
- **Severe symptoms**
  - Avoid for now
  - Re-trial challenge in the future

Long term the diet only needs to be as strict as symptoms require
Phase 3. Long-term ‘maintenance’

- The low FODMAP diet should only be followed as strictly as required to maintain symptom control.
- All foods tolerated should be re-introduced into the diet.
- Long-term, patients should continue to re-challenge foods to re-assess tolerance as tolerance may change over time.
- If the diet is unsuccessful at improving symptoms, patients should return to their usual diet.
Enzyme therapy - Lactase

Lactase supplementation to target lactose is available in two forms
- Pre-incubated with food products e.g. lactose free milk
- Supplemental form to be taken at time of food consumption

Portincasa et al. 2008
- 500 ml cow’s milk (25 g lactose)
- 11,250 units enzyme provided an 88% reduction in symptoms ($p<0.0001$ vs placebo)
- Also reduced breath hydrogen

Lactase supplementation widely used

Portincasa et al. 2008 EJCI
Adjunct therapies

Enzyme therapy – α-galactosidase

• Randomized, double-blind, cross-over trial
• 31 patients with IBS (Rome III)
• 3 day low FODMAP diet followed by 3 day high galacto-oligosaccharide diet
• Improvement in ‘GOS-sensitive’ with full-dose enzyme (300GALU)

Can be trialled in ‘GOS-sensitive’ patients when consuming foods high in GOS

Tuck et al, 2017 AJG

Adjunct therapies

Addition of glucose to target excess fructose

• Adding glucose to excess fructose may enhance small intestinal absorption of fructose
  – Shown to reduce breath hydrogen
• But symptoms not improved in functional bowel disorders when glucose given to excess fructose in sugar solutions and in whole food studies
  – Suggests small intestinal distention may be involved in symptom induction
• Symptoms and breath hydrogen unchanged when glucose added to fructans

Glucose supplementation ineffective for targeting fructose and fructans

Tuck et al, 2017 JHND
Adjunct therapies

Food processing can reduce FODMAP content
- Pickling and canning provided the greatest reductions in FODMAP content
- Highlights the importance of individual tolerance testing

Cooking can reduce FODMAP content
- The water solubility of FODMAPs offers an opportunity to reduce FODMAP content
An individualized approach

• Dietitians can individualize the approach to suit the patients’ needs:
  – A simpler version of a dietary restriction rather than the full approach
  – Selection of foods to modify based on habitual diet
  – Consider habitual diet in light of specific troublesome symptoms
  – Alter recommendations based on patient preference → improve compliance

An individualized approach

• Dietitians can individualize the approach to suit the patients’ needs:
  – Provide practical supportive education and information to give patients the confidence E.g. recipe guidance, shopping lists
  – Ensure the patient is not over-restricting their diet, avoid accumulation of dietary restrictions
  – Ensure appropriate education from the initial consultation regarding length of time modifications are required, when and how to re-challenge
  – Manage expectations regarding symptom response
  – Appropriately implement adjunct therapies
Useful Resources
Useful resources

https://www.monashfodmap.com

The Monash University FODMAP team have provided permission to use this image for this presentation.

Useful resources

<table>
<thead>
<tr>
<th>Vegetables</th>
<th>Guide</th>
<th>Filters</th>
<th>Avocado</th>
<th>United States</th>
<th>Filters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfalfa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Artichoke, globe</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Artichoke, hearts, canned</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Artichoke, Jerusalem</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arugula</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asparagus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aubergine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bamboo shoots, fresh</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bean, sprouts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beans, green</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This serving size contains high amounts of the Polyol sorbitol and intake should be avoided if you malabsorb sorbitol. *Please note that the ‘green traffic light’ rating system allows you to eat multiple serves of ‘green’ foods per meal. Nutritional guidelines recommend that on average per day you should eat at least 5 serves of vegetables and 2 serves of fruits.

This serving size contains moderate amounts of the Polyol sorbitol and intake should be avoided if you malabsorb sorbitol.

https://learn.extension.org/events/3300
Useful resources

Take online FODMAP training
Specialise in the dietary management of IBS using a low FODMAP diet

Online training course for health professionals: The Low FODMAP Diet for Irritable Bowel Syndrome

The Monash University FODMAP team have provided permission to use this image for this presentation

Further reading

- Drossman DA. "Functional gastrointestinal disorders: history, pathophysiology, clinical features, and Rome IV." Gastroenterology 2016 150.6: 1262-1279
- Journal of Gastroenterology and Hepatology 2017 Supplement 1 (Volume 32)
Take away points

1. The low FODMAP diet has proven efficacy in managing IBS patients and should always be implemented under the guidance of a dietitian

2. The low FODMAP diet should be implemented as a 3-phase diet
   - Initial phase, re-challenge phase, long-term maintenance

3. Various adjunct therapies can be utilized in conjunction with the low FODMAP diet
   - Enzyme therapies: lactase, α-galactosidase
   - Use of food processing / altered cooking techniques

Acknowledgements & contacts

• Gastrointestinal diseases research unit, Queen’s University
  – Prof Stephen Vanner

• Department of Gastroenterology, Monash University
  – A/Prof Jane Muir
  – Prof Peter Gibson
  – Dr Jaci Barrett

Contact information:
caroline.tuck@queensu.ca
Twitter: @tuck_caroline
Evaluation & Continuing Education Credits

MFLN Nutrition & Wellness is offering 1.0 CPEU for today’s webinar.

Please complete the evaluation at:
https://vte.co1.qualtrics.com/jfe/form/SV_aWqlu2Mwyw4pYA5

Connect with MFLN Nutrition & Wellness Online!

MFLN Nutrition and Wellness
MFLN Nutrition @MFLNNW
MFLN Nutrition and Wellness
MFLN Nutrition & Wellness
Upcoming Event

The ABC’s of MDI: Gaining a working knowledge of Multiple Daily Injection insulin therapy

• Wednesday, May 30, 2018
• 11:00 am – 12:00 pm Eastern
• learn.extension.org/events/3369

For information on MFLN Nutrition & Wellness go to:
https://militaryfamilies.extension.org/nutrition-and-wellness

Find all upcoming and recorded webinars covering:

- Personal Finance
- Family Transitions
- Military Caregiving
- Network Literacy
- Family Development
- Nutrition & Wellness
- Community Capacity Building

at militaryfamilies.extension.org/webinars